WHAT IS CLAIMED IS:

1   1.   A method comprising:

2   setting an initial bandwidth limit for each of a plurality of active devices

3   associated with a controller;

4   determining a total amount of extra bandwidth from the plurality of active devices

5   that have extra bandwidth, and determining a number of the plurality of

6   active devices that require extra bandwidth; and

7   if there is extra bandwidth, and one or more of the plurality of active devices

8   require extra bandwidth, adjusting the initial bandwidth limit by

9   reallocating the extra bandwidth to the one or more plurality of active

10   devices that require extra bandwidth, the adjusting resulting in a

11   bandwidth limit corresponding to each of the plurality of active devices.

1   2.   The method of claim 1, the method additionally comprising for each of the

2   plurality of active devices, allocating the corresponding bandwidth limit to each

3   of the plurality of active devices.

1   3.   The method of claim 1, wherein the initial bandwidth limit is set to an average

2   bandwidth.

1   4.   The method of claim 3, wherein the initial bandwidth limit is additionally set to at

2   least a minimum bandwidth.

1   5.   The method of claim 1, wherein said reallocating the extra bandwidth from the

2   one or more plurality of devices that have extra bandwidth to the one or more

3   plurality of active devices that require extra bandwidth comprises:

4   decreasing the initial bandwidth limit by the extra bandwidth from the plurality of

5   active devices that have extra bandwidth; and

6   increasing the initial bandwidth limit by an amount based on the extra bandwidth

7   for a select set of the one or more plurality of active devices that require

8   extra bandwidth.

1   6.   The method of claim 5, wherein said increasing the initial bandwidth limit by an

2   amount based on the extra bandwidth comprises determining an add count based

3   on the select set of the one or more plurality of active devices that require extra

4   bandwidth.

1   7.   The method of claim 6, wherein the select set comprises at least one of the

2   following:

3   at least one of one or more of the plurality of active devices that has a total

4   requested bandwidth greater than the average bandwidth; and

5   at least one of one or more of the plurality of active devices that is associated with

6   a priority.

1   8.   The method of claim 7, wherein the total requested bandwidth for a given one of

2   the plurality of active devices comprises an amount of bandwidth to be sent from

3   the given active device to the controller, and an amount of bandwidth already sent

4   from the given active device to the controller.

1   9.   The method of claim 1, additionally determining a reserved bandwidth, and

2   deducting the reserved bandwidth from a maximum bandwidth prior to setting the

3   initial bandwidth limit for the plurality of active devices.

1   10.   A method comprising:

2   determining from among a plurality of devices associated with a controller if any

3   of the plurality of devices is an active device;

4   if one or more of the plurality of devices is an active device:

5   setting an initial bandwidth limit for each of the one or more active

6   devices;

7   determining a total amount of extra bandwidth from the one or more active

8   devices that have extra bandwidth, and determining a number of

9   the one or more active devices that require extra bandwidth; and

10   if there is extra bandwidth, and one or more of the plurality of active

11   devices require extra bandwidth, adjusting the initial bandwidth

12   limit by reallocating the extra bandwidth to the one or more

13   plurality of active devices that require extra bandwidth, the

14   adjusting resulting in a bandwidth limit corresponding to each of

15   the plurality of active devices; and

16   if none of the plurality of devices is an active device, then setting the bandwidth

17   limit for each of the plurality of devices to an adjusted maximum

18   bandwidth.

1   11.   The method of claim 10, the method additionally comprising for each of the one

2   or more active devices, allocating the corresponding bandwidth limit.

1   12.   The method of claim 11, additionally comprising:

2   if one or more of the plurality of devices is an active device, and one or more of

3   the plurality of devices is not an active device, allocating a bandwidth

4   limit of zero for each of the one or more plurality of devices that is not an

5   active device.

1   13.   The method of claim 10, additionally determining a reserved bandwidth, and

2   deducting the reserved bandwidth from a maximum bandwidth prior to setting the

3   initial bandwidth limit for the one or more active devices.

1   14.   The method of claim 13, wherein the reserved bandwidth is available to any of the

2   plurality of devices that is not an active device.

1   15.   An apparatus comprising:

2   circuitry that is capable of:

3   setting an initial bandwidth limit for each of a plurality of active devices

4   associated with a controller;

5   determining a total amount of extra bandwidth from the plurality of active devices

6   that have extra bandwidth, and determining a number of the plurality of

7   active devices that require extra bandwidth; and

8   if there is extra bandwidth, and one or more of the plurality of active

9		devices require extra bandwidth, adjusting the initial bandwidth
10		limit by reallocating the extra bandwidth to the one or more
11		plurality of active devices that require extra bandwidth, the
12		adjusting resulting in a bandwidth limit corresponding to each of
13		the plurality of active devices

1	16.	The apparatus of claim 15, said circuitry additionally capable of allocating the
2		corresponding bandwidth limit to each of the plurality of active devices.

1	17.	The apparatus of claim 15, wherein the select set comprises at least one of the
2		following:
3		at least one of one or more of the plurality of active devices that has a total
4		requested bandwidth greater than the average bandwidth; and
5		at least one of one or more of the plurality of active devices that is associated with
6		a priority.

1	18.	The apparatus of claim 17, wherein the total requested bandwidth for a given one
2		of the plurality of active devices comprises an amount of bandwidth to be sent
3		from the given active device to the controller, and an amount of bandwidth
4		already sent from the given active device to the controller.

1	19.	The apparatus of claim 15, said circuitry additionally capable of determining a
2		reserved bandwidth, and deducting the reserved bandwidth from a maximum
3		bandwidth prior to setting the initial bandwidth limit for the plurality of active
4		devices.

1   20.   A system comprising:

2   a storage controller; and

3   a driver capable of:

4   setting an initial bandwidth limit for each of a plurality of active devices

5   associated with a controller;

6   determining a total amount of extra bandwidth from the plurality of active

7   devices that have extra bandwidth, and determining a number of

8   the plurality of active devices that require extra bandwidth; and

9   if there is extra bandwidth, and one or more of the plurality of active

10   devices require extra bandwidth, adjusting the initial bandwidth

11   limit by reallocating the extra bandwidth to the one or more

12   plurality of active devices that require extra bandwidth, the

13   adjusting resulting in a bandwidth limit corresponding to each of

14   the plurality of active devices

1   21.   The system of claim 20, said driver additionally capable of allocating the

2   corresponding bandwidth limit to each of the plurality of active devices.

1   22.   The system of claim 20, wherein the select set comprises at least one of the

2   following:

3   .   at least one of one or more of the plurality of active devices that has a total

4   requested bandwidth greater than the average bandwidth; and

5   at least one of one or more of the plurality of active devices that is associated with

6   a priority.

1   23. The system of claim 20, said driver additionally capable of determining a reserved

2   bandwidth, and deducting the reserved bandwidth from a maximum bandwidth

3   prior to setting the initial bandwidth limit for the plurality of active devices.

1   24. The system of claim 20, wherein bandwidth comprises a number of I/O

2   (input/output) requests sent to a storage controller from a plurality of peripheral

3   storage devices.

1   25. A machine-readable medium having stored thereon instructions, the instructions

2   when executed by a machine, result in the following:

3   setting an initial bandwidth limit for each of a plurality of active devices

4   associated with a controller;

5   determining a total amount of extra bandwidth from the plurality of active devices

6   that have extra bandwidth, and determining a number of the plurality of

7   active devices that require extra bandwidth; and

8   if there is extra bandwidth, and one or more of the plurality of active devices

9   require extra bandwidth, adjusting the initial bandwidth limit by

10   reallocating the extra bandwidth to the one or more plurality of active

11   devices that require extra bandwidth, the adjusting resulting in a

12   bandwidth limit corresponding to each of the plurality of active devices

1   26. The machine-readable medium of claim 25, wherein said instructions additionally

2   result in allocating the corresponding bandwidth limit to each of the plurality of

3   active devices.

1   27.   The machine-readable medium of claim 25, wherein said instructions that result in

2   increasing the initial bandwidth limit based on the extra bandwidth additionally

3   result in determining an add count based on the select set of the one or more

4   plurality of active devices that require extra bandwidth.

1   28.   The machine-readable medium of claim 25, wherein the select set comprises at

2   least one of the following:

3   at least one of one or more of the plurality of active devices that has a total

4   requested bandwidth greater than the average bandwidth; and

5   at least one of one or more of the plurality of active devices that is associated with

6   a priority.

1   29.   The machine-readable medium of claim 28, wherein the total requested

2   bandwidth for a given one of the plurality of devices comprises an amount of

3   bandwidth to be sent from the given active device to the controller, and an amount

4   of bandwidth already sent from the given active device to the controller.

1   30.   The machine-readable medium of claim 25, wherein said instructions additionally

2   result in determining a reserved bandwidth, and in deducting the reserved

3   bandwidth from a maximum bandwidth prior to setting the initial bandwidth limit

4   for the plurality of active devices.